Amendments to the Drawings:

The attached sheet of drawings includes changes to Fig. 3.. This sheet, which includes Figs. 3 and 4, replaces the original sheet including Figs. 3 and 4.

Attachment: Replacement Sheet.

REMARKS

Before addressing the Examiner's substantive rejections relating to the claims, the Applicants submit the following concise explanation of the relevance of foreign patent references DE19810321 and JP2001-86778 not presented in English, which were cited in an Information Disclosure Statement filed on January 25, 2005.

Reference DE19810321 discloses a current and charge regulation method and circuit that detects the momentary values of the current and charge of a capacitive load and processes them using a stabilization algorithm to provide an output value. The output value is compared with a reference signal for the charge, and the obtained difference signal is subjected to a switch algorithm for controlling a transistor pulse regulator associated with a current source. The circuit has an H-bridge configuration.

Patent reference JP2001-86778 relates to an impact type piezoelectric actuator that moves a driven member reciprocally by charging and discharging a piezoelectric device at different charging and discharging speeds that correspond to the moving direction. There is a first drive mode (high-voltage drive mode), where a battery voltage is applied repeatedly to both the terminals of a piezoelectric unit with an alternately reversed polarity, and a second drive mode (low-voltage drive mode), where the battery voltage application to both the terminals of the piezoelectric unit and short circuit of both the terminals of the piezoelectric unit are repeated alternately. A voltage Vp of the battery is detected by a voltage detection unit and a control unit makes the drive unit drive the piezoelectric device with the first drive mode, when the battery voltage Vp is lower than a prescribed threshold Vr, and makes the drive unit drive the piezoelectric device with the second drive mode, when the battery voltage Vp is not lower than the prescribed threshold Vr.

As such, it should be appreciated that neither of these documents relate to the control of a reverse bias voltage depending on the temperature of an actuator in order to provide hysteresis compensation, as does Applicants' invention.

The Applicants have amended the specification to include the relevant section headings and have added an Abstract. As such, it is believed that the rejections relating thereto have now been overcome.

Moreover, it should be acknowledged that new Fig. 3 of the drawings has been amended to include reference numeral 20, which is disclosed at least at page 2, lines 9-11 of the specification.

The Examiner has rejected claims 1-15 under 35 U.S.C. § 102(a) as being anticipated by a document entitled "Extended temperature range piezo actuator system with very large movement," by Weaver et al., hereinafter Weaver. After carefully considering Weaver, the Applicants respectfully disagree with the Examiner's rejection, as Weaver is not prior art with regard to claims 1-15. Specifically, the subject matter of Applicants' patent application is entitled to the benefit of the foreign priority dates of April 15, 2002 and February 28, 2003 as indicated at page 1 of the Applicants' filed Declaration and Power of Attorney. As such, claims 1-15 are entitled to one of the priority dates identified above, both of which are prior to the publication date of Weaver. Moreover, claim 1 is specifically entitled to at least the benefit of the February 20, 2003 foreign priority date, which as previously stated is before the publication date of Weaver. Therefore, because Weaver does not constitute prior art, the Applicants respectfully request that the rejection of claims 1-15 based on Weaver be withdrawn.

The Examiner has also rejected claims 1, 3-7, 12 and 14 under 35 U.S.C. § 102(b) as being anticipated by Okada (US 6,483,226). In response, the Applicants have amended claim 1 for clarity purposes, and to recite the limitations of dependent claim 2 so as to further distinguish Okada. Specifically, claim 1 now recites that the voltage applying means is arranged to apply a reverse bias voltage to the actuator, the circuit having means for generating a control signal indicative of the temperature of the actuator and means for altering the amount of reverse bias voltage as a function of the control signal.

Okada discloses a system where a negative voltage is applied to a piezoelectric device. However, Okada does not disclose a means for generating a control signal indicative of the temperature of the actuation and means for

altering the amount of reverse bias voltage as a function of the control signal, as is recited in the Applicants' amended claim 1. The advantage of this feature recited in claim 1 is that the reverse bias voltage can be adjusted in response to a temperature measurement, thus allowing the mechanical displacement envelope of the actuator to be maximized across a wide temperature range, while also providing compensation for hysteresis, which occurs in piezo ceramic actuators. In contrast, however, Okada does not disclose such displacement maximization effect, nor does it identify the problems relating to hysteresis in piezoelectric actuators. Thus, the Applicants respectfully request that the rejection of claim 1, and claims 3-7, 12 and 14 depending therefrom be withdrawn.

The Examiner has also rejected claims 2, 8-11, 13 and 15 under 35 U.S.C. § 103(a) as being unpatentable over Okada in view of Hasegawa et al. (US 6,486,743), hereinafter Hasegawa. After review of Hasegawa, the Applicants submit that Hasegawa is non-analogous art, which cannot properly be used in an obviousness rejection. Specifically, Hasegawa relates to adjusting sensitivity and output amplitude of an oscillator in an A.C. system, which differs from the reverse D.C. voltage utilized by the Applicants' present invention. Thus, Hasegawa relates to a different type of system that is not related to piezoelectric actuators, and a person of ordinary skill in the art would not would not make the combination of Hasegawa and Okada.

In addition, the Applicants submit that the advantages associated with the new features of claim 1 are not taught or suggested in Hasegawa, nor does Hasegawa disclose the problem of hysteresis compensation and does not provide a solution for addressing such a problem. As such, a person of skilled in the art would not have any motivation to combine the disclosures of Hasegawa and Okada. Thus, the Applicants maintain that the obviousness rejection of claims 2, 8-11, 13 and 15 is improper, and as such respectfully request that the rejection of such claims be withdrawn.

Moreover, with respect to the limitations of cancelled claim 2, the Examiner has indicated (at page 2, second paragraph) in the Office Action, that it would have been obvious to a person of ordinary skill in the art to combine the

temperature compensation means of Hasegawa with the control circuit of Okada for the benefit of adjusting for changes caused by a change in temperature. However, the features of claim 2, which are now included in claim 1, are not merely for the benefit of adjusting for temperature changes, but rather, they provide the unexpected advantage of maximizing the mechanical displacement envelope of the actuator across a wide temperature range and providing compensation for hysteresis. As such, the Applicants submit that a person of ordinary skill in the art would not combine the features of Hasegawa and Okada.

Thus, in view of the foregoing, it is the Applicants' position that claims 1 and 3-15 are in condition for allowance. Reconsideration by the Examiner and the issuance of a formal Notice of Allowance is most earnestly solicited.

If any further issues remain after this amendment, a telephone call to the undersigned would be appreciated.

Respectfully submitted,

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